

## Patent Abstracts of Japan

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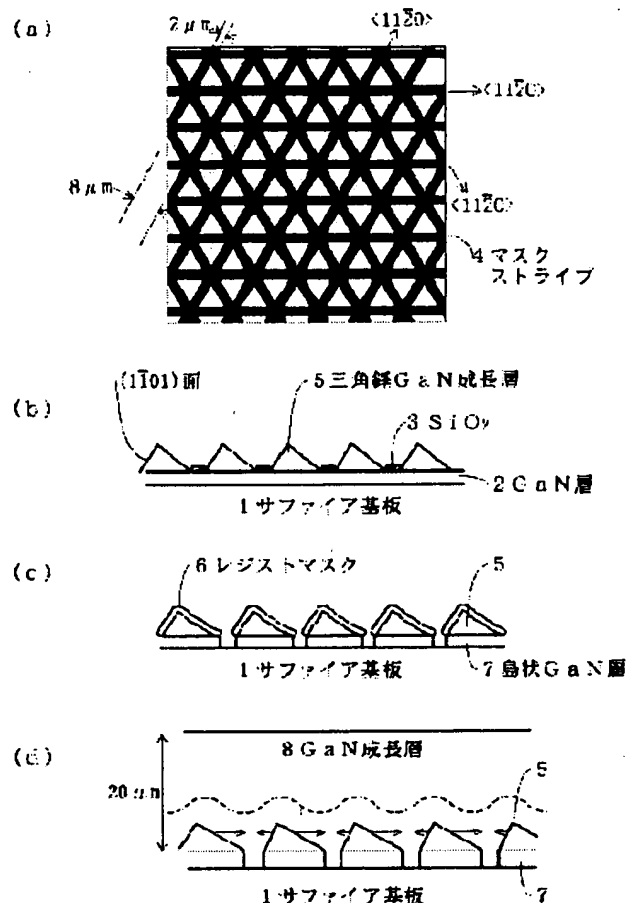
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TITLE : NITRIDE SEMICONDUCTOR  
SUBSTRATE AND ITS  
MANUFACTURING METHOD



ABSTRACT : PROBLEM TO BE SOLVED: To provide a nitride semiconductor substrate and its manufacturing method that has uniformly low dislocation density over the entire surface of the substrate.

SOLUTION: A GaN layer 2 is provided on a sapphire substrate 1. On the GaN layer 2, a mask stripe 4 that is composed of a line of 2  $\mu\text{m}$  and a space of 8  $\mu\text{m}$  is formed in three equivalent  $\langle 1120 \rangle$  directions of  $\text{SiO}_2$  so that an opening part becomes an equilateral triangle. At the equilateral triangular opening by the mask stripe 4, GaN is grown for forming a trigonal pyramid GaN growth layer 5. A resist mask 6 is formed on the trigonal pyramid GaN growth layer 5, the mask stripe 4 and the GaN layer 2 under the mask striped 4 are removed, and the resist mask 6 is removed for forming an inland-shaped GaN layer 7. When a GaN growth layer 8 is grown on the entire surface of the sapphire substrate 1, crosswise growth is promoted so that the trigonal pyramid is buried. When the GaN growth layer 8 is grown by approximately 20  $\mu\text{m}$ , flatness is achieved. When dislocation that is vertically extended from a substrate interface reaches the slant of pyramid structure, it does not reach a bending surface, thus achieving the low dislocation density.

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